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RESEARCH ARTICLE

Academic Integrity in The Age of Artificial Intelligence: World Trends and Outlook for Ukraine from The Legal Perspective

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ARTICLE INFO	ABSTRACT
  *Corresponding Author: vladvokat333@ukr.net	The purpose of this study is to identify possible legal means of ensuring academic integrity in the context of the proliferation of AI in Ukraine and the rest of the world. The research methods include analysis and synthesis, comparative and predictive methods. It has been established that the evolution of artificial intelligence can have both positive and negative effects on academic integrity in the fields of education and scientific research. Therefore, it is necessary to make full use of the potential of artificial intelligence while taking measures to deal with various violations of academic integrity. Such measures should address the organization of the teaching and learning process as well as the assessment of knowledge based on creativity and critical thinking. Given the proliferation of artificial intelligence ensuring academic integrity at the legal level has to include the development by higher education institutions of guidelines (recommendations) as soft law instruments, the adoption of appropriate national legislation on academic integrity as well as relevant international legal regulation. In the current conditions of digitization, the national legislation on academic integrity has to take into account modern technological trends, in particular, the issues of ensuring academic integrity caused by artificial intelligence.

INTRODUCTION

Academic integrity has always been one of the most important pillars in the field of science, research and education. The lack of academic integrity can undermine the credibility of scientific findings, innovation and academic accomplishments. For this reason, the assurance of academic integrity has always been one of the priorities for researchers, scholars and all those involved in science and education.

Nonetheless, academic integrity has never been so much jeopardized as it is nowadays due to the rapid development of artificial intelligence (AI) and its various tools such as ChatGPT, Co-Pilot and

others. AI technologies are the digital basis of a person's unhindered use of his legal rights and freedoms as in everyday life (Haltsova et al., 2021). Strangely enough, it turns out that AI, being the product of scientific research and development itself, has the potential of downgrading further scientific progress by way of substituting original human creativity with artificial human-like innovation and reducing the critical thinking capabilities of researchers and students, who misuse AI tools in their academic or scientific endeavors.

In all fairness, it has to be said that AI as a phenomenon and modern technology is a double-edged sword. On the one hand, it has a great potential to facilitate education and scientific research leading to new discoveries, innovations and technological breakthroughs, which may ultimately revolutionize industry, agriculture and other sectors of the economy. On the other hand, it can also contribute to academic dishonesty and have a disruptive impact on the education system and the field of scientific research, leading to a decline in innovation, scientific and economic development.

Whatever its potential benefits or negative effects the development of AI cannot be stopped. AI is here to stay and set major trends in many fields, including education and scientific research. Therefore, it makes sense to learn using AI tools, parallel computing technologies (Romanova et al., 2019), technologies of the neural network system for controlling multi-connected dynamic objects (Vladov et al., 2022), technologies for using hybrid neurocontrol (Vladov et al., 2022) for the improvement of educational and research environment while mitigating relevant risks to academic integrity.

Purpose and Objectives of the Study

Considering a lack of research of how to ensure academic integrity and deal with academic dishonesty using the law, the purpose of this study isto identify possible legal means of ensuring academic integrity in the context of the proliferation of AI in Ukraine and the rest of the world.

Tackling AI-related challenges and risks for academic integrity is a complex issue requiring a comprehensive approach, which involves technological, organizational and legal solutions. Hence, in order to achieve the goal of this study it is necessary to focus attention on the following objectives: assessment of positive and negative effects of AI on academic integrity in modern education and scientific research as well asexploring all avenues of dealing with academic dishonesty with a particular emphasis on legal tools capable of addressing the problem of ensuring academic integrity against the background of AI utilization, since it is ultimately up to the law to set clear rules of the game in this area. Based on this approach it makes sense to study the practical steps taken by leading higher education institutions (HEIs) and scientific community for the prevention of academic dishonesty against the background of the widespread application of AI tools. In addition, it is also worthwhile studying a legislative proposal on academic integrity put forward in Ukraine with a view to determine its viability against the backdrop of AI proliferation in academic and scientific community.

MATERIALS AND METHODS

The materials used for conducting this study include the works of many researchers who examined various issues concerning AI. In particular, much attention has been paid to studies highlighting AI's impact on academic integrity in higher education and scientific research. With regards to this, a lot of credit has to be given to studies revealing both positive and negative effects of AI on academic integrity carried out by Moorhouse et al. (2023),Asrif (2024),BaHammam (2023),Moya et al. (2023),Rodrigues et al. (2023),Chami (2023). Besides, there are interesting studies of how to change the methods of teaching, learning and assessment in order to address the challenges and risks to academic integrity posed by AI (Elkhatat et al., 2023; Moorhouse et al., 2023; Kumar, 2023). The use of these studies has also contributed greatly to achieving the goal of this research. In addition, the recommendations of the European Network for Academic Integrity (ENAI)on the ethical use of AI in

education as well as the Draft Law of Ukraine on academic integrity have also been useful for the elaboration of legal solutions for the protection of academic integrity from AI related threats in education and scientific research.

The methodology of this articleincludes such methods of scientific research as analysis and synthesis, the comparative method as well as the predictive method. The application of the analysis method is necessary for understanding the impact AI tools on modern science as well as teaching and learning process in higher education. The method of analysis is used for identifying the issues of academic dishonesty arising in connection with the application of AI. The use of the synthesis method made it possible to work out some suggestions and solutions to the identified problems. The comparative method has turned out to be useful for examining different ways of combating academic dishonesty. The predictive method has been helpful for understanding the potential consequences of guidelines, legal policies and legislative proposals concerning AI and academic integrity.

RESULTS AND DISCUSSION

As the development of AI technology, particularly Generative Artificial Intelligence (GAI) is gathering pace its impact on higher education and scientific community is becoming increasingly apparent. There are many ways of using AI tools for the benefit of teaching and learning as well as scientific writing. As it is often pointed out by scholars, the benefits of AI for education and science include better personalization and adaptation of learning paths for students (personalized feedback and academic support for students taking into account their learning preferences), improvement of assessment techniques (helping teachers generate questions and tests, using plagiarism-detection software based on AI, automatic assessment of essays), predictive analytics for proactive intervention (prediction of academic performance and adjustment of assignments for individual students' needs), capacity to process large amounts of data enabling researchers to get valuable information from complex datasets, generation of new ideas that may give some prompts leading to scientific discoveries (Moorhouse et al., 2023; Asrif, 2024; BaHammam, 2023).In addition, AI applications offer such convenient tools for students and researchers as machine translation, formatting, citation and text summarization which facilitate accessibility and inclusivity of higher education and scientific research (Moya et al., 2023;BaHammam, 2023). If used properly in an ethical, honest and responsible way AI can become an important additional tool strengthening human intelligence. In this case AI can greatly contribute to the creation and functioning of a dynamic educational and research environment, which will ultimately bring about social, economic and technological benefits for the society at large.

At the same time along with benefits and advantages AI presents a number of challenges and risks for the academic and scientific community, especially in the context of academic integrity. It is widely acknowledged that accessibility and widespread use of AI tools by students and researchers alike present opportunities for violating the principles of academic integrity and facilitate academic dishonesty. As it is pointed out in numerous studies, AI-related academic dishonesty can assume many forms. First of all, it can manifest itself in the form of plagiarism and other violations of copyright. Other forms of academic dishonesty include cheating on exams, fabrication of data and falsification of bibliographic references etc. (Rodrigues et al.,2023) As it has been observed, AI generated content can be misleading and inaccurate. As a result, it can fabricate research and fake sources, etc. (Chami, 2023)

The problem of academic dishonesty is not new. It has been known for dozens of years if not centuries. However, these days this problem is only exacerbating due the proliferation of AI technologies in all walks of life and a great temptation for students as well as researchers to save their time and get better results as fast as possible by using AI tools. According to some studies conducted by Ukrainian researchers 60,8% of the surveyed students have been using AI tools for completing their academic assignments. Furthermore, only 21.6% of those surveyed consider the use

of AI tools for completing academic assignments and scientific writing as a violation of academic integrity, whereas 29,7% of the respondents do not think so, with 45,9% hesitating to answer (Palamar & Naumenko, 2024). Obviously, many of the ordinary students regard this practice as acceptable. In other words, for many of them presenting a text generated by Chat GPT or similar AI tools as their own work is not a huge ethical or legal issue. Moreover, according a survey conducted in the USA most students believe that using AI has already helped them accomplish better learning outcomes and over 77 % of them think that generative AI technologies can improve learning outcomes in the future (Cherukuri et al., 2023). Therefore, there is already a wide acceptance of AI tools among students in different countries as well as determination to continue using AI for academic purposes despite any possible concerns over academic integrity.

However, most teachers, instructors and other educators are greatly concerned about the potential negative consequences of AI related violation of academic integrity for personal, social and professional development of students.As a result of overreliance on AI tools students risk losing their critical thinking skills as well as their research, analytical and creative abilities, which are crucial for their personal and professional development. In addition, this may lead to a lack of human interaction and communication skills, which are essential for social development and social integration of individuals (Mohammadkarimi, 2023; Asrif, 2024). The potential loss or diminishing of these skills and abilities is a major downside of AI use in higher education and research, which may lead to dire social and economic consequences in the long run.

In light of the above it becomes obvious that the use of AI should not be banned in the field of education and scientific research. Instead, it's better to take advantage of the opportunities presented by AI technology provided that academic integrity is ensured. In practical terms it means that there has to be a set of measures in place preventing or eradicating academic dishonesty.

One of the first steps in dealing with academic dishonesty is making sure that there are tools or other ways of identifying AI generated content. Along with AI text generation tools such as ChatGPT, Microsoft Co-Pilot, Google Bard AI and other similar tools the modern age of digital technologies has produced some digital tools designed for the detection of text generated by AI. In particular, such AI text detection tools include GPT Zero, Turnitin, Writer, Copy leaks, Cross Plag etc. All these digital tools are intended to facilitate the task of detecting AI related plagiarism. However, their ability to distinguish between AI generated text and human-written text is still far from ideal. According to some studies on the efficacy of AI content detection tools their performance greatly depends on the generation of AI content creation tools used to generate text. In particular, AI content detection systems demonstrate better accuracy and reliability with regards to Chat GPT 3.5 generated text. However, when it comes to Chat GPT 4 generated content their performance drops significantly (Elkhatat et al., 2023). In other words, AI content detection systems can hardly keep up with the pace AI content generation systems. This calls into question their accuracy and reliability with regards to plagiarism detection, at least for the time being.

In addition, there may be privacy and security concerns when students' papers are uploaded to websites featuring AI content detection tools. Furthermore, there may be ethical issues like lack trust between academic staff and students, if their work is constantly screened with AI content detection software. Considering the drawbacks of AI content detection tools, many universities discourage their use while other HEIs try to make sure that such tools are not the only way to determine whether a student has breached academic integrity principles (Moorhouse et al., 2023). In light of this the best approach appears to be a combination of manual checking for plagiarism and the use of AI content detection software as auxiliary tools. Moreover, any checks for plagiarism must take into account the context of the academic or scientific assignment.

Another important step towards ensuring academic integrity in the digital age of AI is the acknowledgment of the fact that certain AI generated content has been used in academic or scientific

writing. Acknowledgment of AI use academic or scientific papers is basically an act of honesty akin to referencing human authors. Even though there may be a lot of arguments about the authorship of the content generated by AI from a purely legal perspective, when it comes to the acknowledgement of AI use it is more about admitting the limits of one's own contribution than about giving credit to a particular author. That's why it is important to outline the scope AI content use in academic or scientific papers, thus giving an idea of one's own contribution. Additionally, it would be highly advisable to indicate the purpose and context of using AI in academic and research work from the perspective of ensuring academic integrity. Besides, this would help understand the methodology of an academic or scientific work as the use of AI tools can be also regarded as a new supplementary method of research.

The widespread adoption of AI tools by students necessitates an overhaul of the approach to the arrangement of teaching and learning activities in HEIs. The main emphasis of the new approach has to be shifted towards in-class activities, problem-solving assignments and creative tasks requiring students' personal participation and collaboration. This does not necessarily mean that AI tools have to be totally banned or excluded from learning activities. AI can still be useful and remain an important part of the learning process as long as it only augments human cognition as a supplementary tool and does not substitute critical thinking skills.

In this context some recent studies suggest that perhaps there should be a return to "analog" forms of higher education. It is convincingly argued that due to the ongoing evolution of AI tools, products and services automating the entire writing process it will become even more difficult to detect AI related plagiarism and therefore it may be necessary to go back to such classic methods as paper and pencil writing or in-person examinations in order to protect academic integrity and maintain the quality of education (Kumar, 2023). The main advantage of this "analog" idea is that it can be easily implemented as it does not require inventing something new. What it does require, however, is striking the right balance between classic well-established methods designed to maintain academic integrity and new AI assisted methods of learning intended to enhance human abilities to process large amounts of data, provide additional insights and help with technical issues like grammar checking, text editing etc.

One of the most challenging issues arising in connection with the use of AI by students is the assessment of their knowledge. Traditional assessment approach based on the reproduction of the learning materials used by students does not work in the age of AI, since AI tools are capable of answering questions based on relevant materials. For this reason, assessment tasks need to be redesigned taking into account the capabilities of modern AI tools. As it is rightly pointed out by a number of researchers, new assessment tasks need to be focused on creativity and critical thinking, because at the moment AI systems still struggle with such tasks. Besides, adding some context to assessment tasks can also be useful. Furthermore, mitigating the effects of AI tools can also be achieved through the assessments of oral and handwritten tasks performed in class (Moorhouse et al., 2023).

Dealing with AI related academic dishonesty can also require some teaching on how to use AI tools in an ethical and responsible way. It is not uncommon for students to violate the principles of academic integrity using AI due to a mere lack of knowledge about proper and responsible use of AI for educational purposes. Therefore, professors and other educators have to make sure that course descriptions include information and recommendations on ethical and responsible use of AI tools. Sometimes giving proper guidance on how to avoid AI related violations of academic integrity can be even more effective than other ways of dealing with such violations.

Whatever approach is taken in order to deal with AI related academic dishonesty it needs to be clearly set out in some documents easily available to academic staff, students and researchers. In other words, there has to be some legal framework laying down rules concerning the use of AI for

academic and research purposes aimed at ensuring academic integrity and maintaining the quality of higher education and research.

In recent years a lot of top-ranking universities in different countries have adopted guidelines on the use of AI tools for academic purposes. These guidelines contain recommendations, suggestions, advice and best practices concerning the application of AI by students and academic staff. Such guidelines are not mandatory by their legal nature (Moorhouse et al., 2023). Even though, they are not legally binding they can still be regarded as a variation of "soft law". Despite the fact that they lack a legally binding force, they are applied in practical situations and have an impact on real-life cases.

In general, soft law is viewed as a complement or an alternative to hard law, which is the kind of law that has a legally binding force. Moreover, at some point under certain conditions soft law can even turn into hard law (Zhu&Tang, 2024). Besides, it is also argued by legal scholars that soft law instruments have certain advantages over hard law. In particular, soft law instruments are more flexible and cope better with diversity. In addition, they are directly available to non-state actors (Shaffer&Pollack, 2011).

Considering the pace of technological progress in the field of AI, its complexity as well as its positive and negative effects of higher education and research, adoption of guidelines as soft law instruments seems to be a good way forward. This will help select the best regulatory practices for the protection of academic integrity in the context of AI use in HEIs. Subsequently, the most successful of such practices (guidelines) can be gradually transformed into hard law at the level of HEIs if they decide to adopt relevant mandatory policies. Ultimately, it would desirable to see the transformation of such guidelines into mandatory legal provisions at the level of national and maybe even international law. After all, there are already calls for the elaboration of international guidelines addressing AI related ethical issues in research and scientific writing as well as the establishment of a relevant consortium comprising AI developers, lawyers, representatives of academic institutions, publishers and other stakeholders (BaHammam, 2023).

With regards to international guidelines it should also be mentioned that there have already been efforts to work out some general recommendations on the ethical use of AI tools in education. Recently, a number of relevant recommendations have been elaborated and presented by the ENAI. These recommendations contain a bunch of basic rules, principles, standards and practices of maintaining academic integrity when using AI tools in education and research. In particular, they include the principle of AI acknowledgement meaning that whenever AI tool is used this fact should be acknowledged in a way that takes into account the context, the institutional policies and other requirements. Interestingly enough, it is also advised to specify the input fed to an AI application whenever possible. However, according to these recommendations AI cannot be indicated as a co-author, since it is not capable of taking any responsibility for the content of a publication. The recommendations developed by the ENAI also place a particular emphasis on the need to educate academic staff and students about ethical use of AI. In addition, it is emphasized that there should be guidance at the national level as well as institutional policies concerning the ethical use of AI by students, educators and researchers (Foltynek et al., 2023). Despite the fact that these international guidelines do not have a binding legal force they can serve a basis for discussion and elaboration of legally binding provisions and regulations at the national and institutional levels.

While institutional level of ensuring academic integrity implies the adoption of relevant guidelines and policies by HEIs as well as scientific and research institutions the national level requires the adoption of laws and other regulations by the national authorities. Unlike institutional guidelines and policies applying only to those associated with relevant institutions the national legislation of any country applies to all those engaged in academic and research activities on its territory. Moreover, unlike institutional guidelines which can be regarded as soft law the provisions of national

legislations are for the most part hard law meaning that they have a legally binding force. Therefore, the fundamental principles of maintaining academic integrity must be enshrined in national laws and regulations. In other words, the national legislation on academic integrity must be the centerpiece in the legal framework designed to deal with AI related academic dishonesty.

In most countries matters concerning AI related academic dishonesty are dealt with primarily on the basis of the legislation on copyright and related rights if the violations of academic integrity can be regarded as plagiarism. However, some countries have developed specific legislation on academic integrity. For instance, in 2010 the Ministry of Education and Culture of Indonesia adopted Regulation on the Prevention and Management of Plagiarism in Higher Education. In particular, this regulation lays down a number of sanctions and penalties for plagiarism in academic writing, which include verbal and written warnings, postponement and cancellation of exams, prohibition on the participation in university academic activities, revocation of academic degrees etc. (Darajati et al., 2023) Following the example of such countries Ukraine has also embarked on the way towards the adoption of its own national legislation dealing with violations of academic integrity. Recently, a number of members of Ukraine's Parliament have come up with a draft law on academic integrity (On academic integrity, 2024).

Apart from some general provisions, the draft law on academic integrity presented to the Parliament of Ukraine on the one hand imposes a number of obligations on educators, students and researchers stipulating how they are supposed to maintain academic integrity when participating in various academic and research activities and on the other hand includes provisions on different kinds of academic dishonesty (violations of academic integrity) as well as sanctions for such violations.

The list of academic integrity violations in the draft law includes such infringements as academic plagiarism and self-plagiarism (presenting an earlier published work as a new one), fabrication and falsification of data about the results of academic activities, false authorship attribution (inclusion of a person who did not take part in the creation of a work in the list of its authors), unauthorized assistance in the performance of an academic task; unfair assessment of an academic task etc. It is worth noting that the list of academic integrity infringements set out in this draft law is not exhaustive. Other types of academic dishonesty can also be recognized as infringements by other laws of Ukraine or HEIs and research institutions themselves.

The draft law features a diverse array of sanctions for academic integrity infringements. In particular, the list of sanctions includes expulsion from scientific councils and other collegial bodies, suspension of the right to take part in contests for grants and academic mobility programs, expulsion from a HEI, revocation of a higher education degree and relevant qualifications, revocation of a scientific degree or scholarly rank, stripping of awards, dismissal from a HEI or research institution etc. The types of such sanctions applied in each individual case depend on whether an offender is a student, educator or a researcher.

Even though this draft law lays down a fairly comprehensive system of legal provisions aimed at ensuring academic integrity in education and research fields, it is quite clear from its analysis that it does not contain any specific rules addressing the challenges and risks to academic integrity posed by AI tools and other digital technologies. Due to the pervasive nature of AI and its growing popularity failure to address these technological challenges and risks can drastically reduce the overall effectiveness of the national legislation on academic integrity. Without specific provisions allowing to take into account various complications brought about by AI such legislation will be obsolete as soon as it is adopted.

In the age of digitalization ensuring academic integrity at the level of national legislation requires the adoption of laws and regulations that comprehensively address all issues related to academic integrity taking into account the main technological trends such as the development of information

and communication technologies as well as the rapid proliferation of AI. The elaboration of such legislation needs to rely, among other things, on research findings reflecting the impact of AI on academic integrity as well as the experience of leading HEIs in dealing with AI related academic dishonesty, including relevant guidelines and institutional policies.

CONCLUSION

The development of AI is a new powerful technological trend that has great impact on many areas of life, including education and research. AI tools can bring about a lot of benefits as well as challenges and risks for education and scientific research. On the one hand, it can facilitate teaching and learning process, contribute to scientific discoveries promoting social, economic and technological development. On the other hand, it can undermine academic integrity, which can have detrimental effects on critical thinking and creativity eventually leading to human degradation, social and economic decline.

In light of this it is necessary to make full use of the benefits of AI and simultaneously implement measures designed to deal with academic dishonesty. Such measures may include a combination of manual checking for plagiarism and the use of AI content detection software as auxiliary tools, acknowledgement of the use of AI by students and researchers, a shift towards well-established methods of teaching such as in-class activities, problem-solving assignments and creative tasks requiring students' personal participation and collaboration, an overhaul of assessment tasks with an emphasis on creativity and critical thinking, oral and hand-written examinations, educating academic staff, students and researchers about the ethical and responsible use of AI that does not compromise academic integrity.

Considering the pace of technological progress in the field of AI, its complexity as well as its positive and negative effects of higher education and research, adoption of guidelines as soft law instruments seems to be a good way forward. This will help select the best regulatory practices for the protection of academic integrity in the context of AI use in HEIs. Subsequently, the most successful of such practices (guidelines) can be gradually transformed into hard law at the level of HEIs if they decide to adopt relevant mandatory policies. Ultimately, it would desirable to see the transformation of such guidelines into mandatory legal provisions at the level of national and maybe even international law.

Ensuring academic integrity in the age of AI requires a proper legal framework at the level of HEIs and research institutions as well as national and international levels. Guidelines on the protection of academic integrity and use of AI can be used as soft law instruments at the level of HEIs and serve as a basis for further elaboration of the relevant hard law at the level of national law and perhaps even international agreements. As a country trying to develop its own national legislation on academic integrity Ukraine has already prepared the relevant draft law. However, despite the comprehensive nature of this draft law it lacks specific provisions addressing the challenges and risks associated with AI. In order to have a real impact on academic integrity in the age of digitalization the relevant national legislation needs to take into account the main technological trends, including the development and proliferation of AI.

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